

Using Internet Services for Personal Information Management

Kişisel Bilgi Yönetimi için İnternet Hizmetlerinin Kullanımı

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Abstract: *The popularity and improvement in features provided by various Internet services are leading us to a situation where personal information items can be stored and managed online. Personal Information Management (PIM) refers to a set of activities a person performs in order to acquire or create, store, organize, maintain, retrieve, use and distribute personal information for different purposes, including preserving personal and family information assets. The main purpose of this study was to investigate perceptions of university students of Internet services for managing their personal information; the type of information stored by them; how they organize, manage, access and control information distribution; and their concerns regarding privacy and security of their personal information. A pre-tested questionnaire was used for data collection and 212 students from two public universities took part in this study. It was found that 75% of the respondents were using Internet services for storing and managing some of their personal information items. The Internet services were mainly used by the students for storing email addresses and messages, personal text documents and photos. Only a small number of the students were using online storage for maintaining information about their appointments, telephone numbers, draft documents, audio and video recordings, and list of things to be done. Over two-thirds of the respondents revealed that they only store non-sensitive personal information due to their concerns related to privacy and security of personal information. The paper also suggests certain measures for the improvement of personal information management skills of students and the general public.*

Keywords: *Personal Information Management, Internet services, social networking services, information fragmentation, Singapore*

Öz: *Çeşitli İnternet hizmetlerinin popülerliği ve özelliklerinin gelişmesi bizi kişisel bilgilerin de çevrimiçi olarak depolandığı ve yönetildiği bir duruma doğru götürüyor. Kişisel Bilgi Yönetimi (KBY) kişisel ve ailevi bilgilerin korunmasını da içeren farklı amaçlarla bir kişinin kişisel bilgileri sağlamak veya yaratmak, depolamak, düzenlemek, yaşatmak, bu bilgilere erişmek, bu bilgileri kullanmak ve dağıtmak amacıyla gerçekleştirdiği bir dizi etkinlik olarak tanımlanır. Bu araştırmanın temel amacı üniversite öğrencilerinin kendi kişisel bilgilerini yönetmek için kullandıkları İnternet hizmetleri hakkındaki algulamalarını, ne tür bilgi depoladıklarını, bu bilgileri nasıl düzenlediklerini, yönettiklerini ve bu bilgilere nasıl erişim sağladıklarını, bilgilerin dağıtımını nasıl denetlediklerini ve kişisel bilgilerin gizliliği güvenliği hakkındaki düşüncelerini araştırmaktır. Veri toplamak için ön testi yapılan bir anket kullanıldı ve araştırmaya iki kamu üniversitesinden 212 öğrenci katıldı. Deneklerin %75'inin İnternet hizmetlerini kişisel bilgilerini depolamak ve yönetmek için kullandıkları görüldü. Denekler İnternet hizmetlerini genelde e-posta adres ve iletilerini, kişisel metin türü belgeleri ve fotoğrafları depolamak için kullanmaktadırlar. Sadece çok az sayıda denek randevuları hakkındaki bilgileri, telefon numaralarını, taslak belgelerini, ses ve görüntü kayıtlarını ve yapılacak işler listesini çevrimiçi olarak depolamakta ve yaşatmaktadırlar. Deneklerin üçte ikisinden fazlası kişisel bilgilerin gizlilik ve güvenliğiyle ilgili kaygılarından dolayı sadece duyarlı olmayan kişisel bilgileri depolamaktadırlar. Bildiride öğrencilerin ve halkın kişisel bilgi yönetim becerilerini geliştirmeleri için belli öneriler de yer almaktadır.*

Anahtar sözcükler: *Kişisel Bilgi Yönetimi, İnternet hizmetleri, sosyal ağ hizmetleri, bilgi bölünmesi, Singapur*

Introduction

Personal Information Management (PIM) is not a new concept and all individuals in their lives handle a considerable amount of information for undertaking personal responsibilities and performing diverse tasks and activities. For this purpose, they need to use different types of personal information items such as records of personal property and other

assets, academic and professional transcripts, medical records, insurance policies, mortgage contracts, bank statements and records of other financial transactions, legal documents, family photos, contact information of friends and relatives, etc. Proper management and access to this information can make a big difference in their lives. Mismanagement of personal information on the other hand, may result in loss of family heritage, delays in legal proceedings, financial losses, delays in medical treatment, and problems in making insurance and other claims. In many situations, inadequate and inappropriate management of personal information may also cause stress, anxiety and embarrassment. Indiscriminate acquisition of information and its mismanagement can also create information overload. As a result, it is now becoming crucial for all individuals in the society, whether employed or unemployed, even for housewives, senior citizens and children, to properly manage their personal information. Another related issue is that due to technological advancements, personal information may be available in many different formats such as digital documents, audio-visual recordings, and multimedia objects (Bergman, Boardman, Gwizdka, & Jones, 2004). Many individuals may not be able to effectively manage their valuable personal information either due to inadequate awareness or lack of desired information handling competencies.

These days, due to technological advancements and popularity of digital tools and gadgets, even ordinary citizens generate voluminous amounts of electronic information artifacts. As the number of digital objects grows, people may feel the pressure to properly store and organize these items for fast and accurate retrieval. As an effort to overcome problems associated with managing personal information items, the concept of PIM is gaining popularity. Personal Information Management includes activities such as storage, organization, and retrieval of information by an individual for his/her own use (Bergman et al., 2004). A more comprehensive definition of PIM is provided by Jones (2008) and it states:

Personal Information Management (PIM) refers to both the practice and the study of the activities a person performs in order to acquire or create, store, organize, maintain, retrieve, use and distribute the information needed to meet life's many goals (everyday and long-term, work-related and not) and to fulfill life's many roles and responsibilities (as parent, spouse, friend, employee, member of community, etc.). PIM places special emphasis on the organization and maintenance of personal information collections in which information items, such as paper documents, electronic documents, email messages, web references, handwritten notes, etc., are stored for later use and repeated re-use.

Jones (2008) divides personal information management into seven interrelated activities which are finding, keeping, organizing, maintaining, managing information flow, measuring and evaluating, and making sense. In order to facilitate personal information management activities, a wide range of tools and systems have been developed. For example, personal digital assistants (PDAs) usually provide many PIM features such as organizer, calendar, to-do list, tasks management, notes, etc. A previous study identified 27 artifacts used by mobile workers to manage their information (Lees, Meech, & Thomas, 1996). The 10 most commonly used artifacts were diary, mobile phone, loose paper, work file, filofax, Dictaphone, electronic PIM, address book, notepad, and laptop. Since then some of these tools have been replaced with new and more powerful tools.

The choice of tools for managing personal information is usually determined by the type of information objects to be managed. For example, a contact phone number list may be best managed by using the phone itself while personal photos may be managed and shared online by using services such as "Flickr". The most frequently stored management personal electronic information includes telephone numbers, names and addresses, appointments, reference documents, meeting notes, rough work, to-do lists, reminders, noteworthy dates, and identification information (Lees et al., 1996). This list is not exhaustive, as now many new types of information objects are being created and managed by people. Although different tools and gadgets can be used for effective personal information management, many people may not be aware of their features or how to effectively use them. Similarly, the ways people prefer to manage their personal information items may differ from one to another. For example, it was reported that more people prefer "organization" to "finding" as only 1 in 20 people would prefer seeking the needed information to organizing it into different folders for future retrieval (Teevan, Jones & Capra, 2008). In order to further improve personal information management, efforts are being made to introduce new methods and techniques such as weaving threads of actions using context (Shimakawa, Kaede, Nakamura, & Azuma, 2004), adaptive semantic approach (Kratkiewicz & Mitchell, 2004) and associative personal information management (Diehl, 2009).

One problem associated with using multiple tools is fragmentation of information across several devices which may be more useful in handling a specific type of information objects such as documents, emails, instant messages, photos, audio and sound recordings, etc. Even information related to an activity, e.g. a research project, may be scattered into many folders or applications (Excel, MS Word, PowerPoint, SPSS), or devices. This situation is further worsened if documents have many versions, stored at different places. Another related problem associated with personal information management is the inability of mobile devices to exchange data among them. This fragmentation may result in wastage of time in locating the needed information from multiple locations or devices or even losing it all together. Even though currently no perfect solution is available to avoid information fragmentation,

this problem may become less crucial due to likely convergence of different technologies (Jones, 2008). However, Barreau (2008) feels that the real challenge in managing personal information is not the unavailability of appropriate technological tools but rather the lack of basic information organization skills among the general public.

Many Internet services, such as Gmail, Yahoo, Hotmail, Google Apps, Office online, Facebook, and MySpace, in addition to their respective functionalities, also provide storage space to their account holders for managing their personal information items (Jiang & He, 2007). A recent study on the use of Internet services has shown that over 54% of the users of these services belonged to the age group 16-24 years (Ofcom, 2008). It is, therefore, worth studying whether or not young adults are also using the Internet services for managing their personal information. The main objective of this study was to understand the usage of different Internet services by the students for managing their personal information objects. Other areas covered by this study include: the reasons for using Internet services for PIM, types of information objects managed online, mechanisms used for accessing and retrieving personal information items, and finally concerns of the students regarding the privacy and security of their personal information objects.

Method

A pretested questionnaire was used for collecting data for this study. There were 5 sections in the questionnaire. The first section collected information about the possible reasons for using the Internet services for managing personal digital information objects. The second section was on the types and frequency of personal information stored. The third section solicited information about the mechanisms used by the respondents for organizing their personal digital items through different features provided by the Internet services. Next, the respondents were asked to indicate how the stored information objects were retrieved. Finally, the participants were asked about their perceptions of privacy and security of personal information stored using the Internet services.

Data was collected from two public universities in Singapore, i.e. Nanyang Technological University and National University of Singapore, in October, 2009. As this study focused on management of digital information objects, students from IT related disciplines (Digital Media, Signal Processing, Computer Engineering, and Computer Aided Manufacturing) were included in this survey. A convenience sampling technique was used and instructors of different courses were approached to seek their approval for conducting this survey in their respective classes during the class break time. A total of 270 questionnaires were distributed and 212 filled-in questionnaires were returned, resulting in a response rate of 78.5%.

Findings

The following sections provide key findings of this survey.

Demographic Information

Fifty-two percent of the participants were male and the remaining 48% were females. A majority (78%) of the respondents were in the age group of 21 to 30 years while 14% were less than 21 years old. The remaining 9% were more than 30 years old.

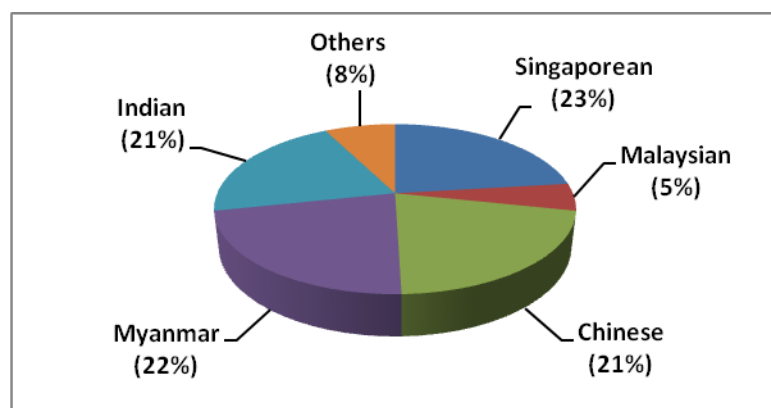


Figure 1. Nationalities of the respondents

As both the participating universities enroll international students, a wide diversity was found in the nationality of the participating students. The majority of the students were from Singapore, China, Myanmar and India (Figure 1). A similar diversity was found in the academic programs attended by the respondents: 33% of the students came from

computer engineering, 31% from signal processing, 24% from digital media, and the remaining 12% were from computer aided manufacturing.

Reasons of Using Internet Services for PIM

The respondents were asked about the Internet services used by them for storing and managing their personal digital information objects. Two-thirds of the respondents reported using such services for managing their personal information (Table 1). Those respondents who were using the Internet services for storing and managing their personal items were asked to indicate reasons for using these services. Over 83% of the respondents said they use Internet services as the stored information can be accessed anytime anywhere and these items can be easily shared with others. Similarly over 70% of the students agreed that the Internet services provide adequate storage space, and offer useful features for organizing and retrieving personal information items. Another reason given for using Internet services was lack of need to maintain multiple copies of personal items (61.8%). However, only less than half of the respondents agreed that the Internet services providing personal storage space are trustworthy for maintaining private and confidential personal information.

It appeared that a sizeable majority of the students were convinced of the advantages of using Internet services for storing their personal digital items but at the same time had some concerns regarding privacy and confidentiality of their personal information. Probably that is the reason why they thought these services were not as reliable as their personal computers for storing personal confidential information.

Table 1. Reasons for using Internet services for storing personal information items (N=160)

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Internet services make my personal digital information items available anywhere anytime.	4.4%	3.2%	8.1%	52.5%	31.8%
Most internet services offer enough storage capacity for storing my personal digital information items.	3.1%	12.5%	13.1%	51.3%	20.0%
Using an internet service as central storage reduces the need to maintain multiple copies of my items.	2.5%	16.9%	18.8%	50.0%	11.8%
Most internet services are more stable than my own PC in terms of system stability.	5.0%	23.8%	25.0%	36.8%	9.4%
Uploading and downloading speed of personal information items from internet services is satisfactory.	5.6%	20.6%	19.4%	46.9%	7.5%
Personal information items can easily and effectively be organized by using features of the internet services.	2.5%	8.8%	20.6%	61.8%	6.3%
Search features of Internet services allow me to retrieve my information item quickly and accurately.	0.0%	15.0%	18.8%	54.4%	11.8%
Personal digital information items can easily be shared with others.	0.6%	5.7%	10.0%	65.0%	18.7%
Most internet services are trust-worthy for privacy and confidential information.	4.4%	28.2%	24.3%	38.8%	4.3%
Internet services are only suitable for non-sensitive information.	3.1%	12.5%	15.6%	41.9%	26.9%

Types of Personal Information Objects Stored

A scale of 1 to 5 was used to elicit information about the frequency at which students put their personal information in the storage provided by different online services (Table 2). As expected, email addresses were the most frequently stored information (mean score 3.94) as it is a standard feature provided by almost all email services. The next frequently stored information was bookmarks of important websites. Text documents (mean score 3.57), mailing addresses (mean score 3.48), and personal photos (mean score 3.43) were the next three frequently stored items by the students in the space provided by online services. Sound and video recordings were stored less frequently, probably due to their big file size and slow uploading and downloading speed.

Comparatively less frequently stored information items in online storage were appointments (mean score 2.43), 'to-do-lists' (mean score 2.40), and telephone numbers (mean score 2.18). Probably the respondents preferred using other tools such as Microsoft Outlook or telephone/cell phone directories for storing such information for easy access and use. The least frequently stored information items were personal identification information such as IDs and passwords of various online services, information about bank account(s), passport number, airlines' frequent flyer accounts, etc. This is understandable as previously over two-thirds of the students said that they do not keep confidential and sensitive information in the storage space provided by different Internet services.

Table 2. Types of personal information objects stored in space provided by Internet services

Digital Information Item	Use Frequency of Internet Services		
	N	Mean Score (scale: 1-5)	Standard Deviation
Email Addresses	160	3.94	1.13
Website Links	159	3.62	1.08
Text Documents	160	3.57	1.12
Mailing Addresses	158	3.48	1.28
Photos	160	3.43	1.06
Draft works - work documents for continuation at home or elsewhere	158	2.70	1.10
Sound and video recordings	160	2.67	1.20
Schedules	160	2.55	1.12
Reminders	159	2.52	1.11
Noteworthy dates	160	2.50	1.10
Videos	156	2.49	1.12
Appointments	160	2.43	1.12
To Do List	160	2.40	1.07
Telephone Numbers	160	2.18	1.07
Personal Identification Information (e.g. passport, IDs and passwords, bank accounts, etc.)	160	2.04	1.23

Organizing Personal Digital Information Items Online

It is important that digital items stored in the online storage should be properly organized for their fast, accurate and convenient retrieval. A group of statements were provided to the participating students to understand their information organization behavior (Table 3). It was interesting to note that 31.2% of the students said that they either 'always' or 'most of the time' pay adequate attention for organizing their personal information items online, while almost the same number of students (30.7%) revealed that they 'seldom' or 'never' organize their information online. A similar trend was observed for the next three statements related to using hierarchical folders, tagging or labeling of information items, and the use of a combination of hierarchical folders and tagging, where around 30% of the students each were either using these features 'always/most of the time' or 'seldom/never'.

It was encouraging to note that over 45% of the students said that they use meaningful file/folder names and tag/label descriptions to adequately represent the contents of their information items. It was also worth noting that 42.5% of the students felt that the features provided by online services were useful in organizing their personal information

items. On the whole, it was observed that less than half of the students were properly organizing their personal information items in the storage provided by the Internet services. An implication of this behavior is that they may face problems in retrieving their stored information items quickly and accurately, particularly once the number of online objects has grown considerably. In a worst case scenario they may lose their valuable personal information all together. There is a need to create awareness among the students about the importance of proper information organization, no matter whether stored in their personal computers or in the storage provided by online services.

Table 3. Organization of personal information items online (N=160)

Statement	Frequency				
	Never	Seldom	Some-times	Most of the time	Always
I pay adequate attention to organizing my digital information items for their easy retrieval.	11.9%	18.8%	38.1%	21.9%	9.3%
I use hierarchical folders for organizing my digital information items online.	7.5%	27.5%	29.4%	25.0%	10.6%
I use tagging/labeling to organize my digital information items online.	7.5%	23.1%	36.9%	24.4%	8.1%
I use a combination of hierarchical folder structure and tagging/labeling for organizing my digital items.	10.6%	21.9%	38.4%	22.5%	6.6%
I use meaningful file and folder names which adequately represent the content of those files and folders.	6.3%	11.9%	36.8%	27.5%	17.5%
I use meaningful tagging/labeling descriptions which adequately represent the content of my items.	6.3%	15.0%	29.4%	38.1%	11.2%
Available features of the Internet services are useful in organizing my information items online.	5.6%	13.8%	38.1%	31.9%	10.6%

Retrieval of Information Stored Online

A group of statements were used to understand information retrieval behavior of the students. Nearly 34% of the students revealed that they 'always' or 'most of the time' browse through their online folders to reach the desired item (Table 4). Another 41.9% of the students said that, if they do not know the exact location of their items, they frequently use search features to retrieve such items. Some 26.3% of the students also revealed that, due to searching convenience, they 'always' or 'most of the time' search their online items even when they know their locations. However, it was worth noting that more than 40% of the students were only 'sometimes' using various retrieval approaches, which indicates no clear preference for a particular approach. It is equally worth noting that one-half of the students accepted that 'sometimes' they encounter problems in retrieving the stored items. It could be due to their inappropriate information organization or lack of adequate browsing and searching skills or a combination of these two factors.

Table 4. Retrieval of personal information items (N=160)

Statement	Frequency				
	Never	Seldom	Some-times	Most of the time	Always
I browse through my online files and folders to reach my desired digital items	6.9%	16.8%	42.5%	26.3%	7.5%
I use free text search or other search facilities to access an item if I don't know its exact location.	7.5%	15.0%	35.6%	33.1%	8.8%
I use free text search or other search facilities to access an item for ease of use even if I know its location.	6.9%	23.7%	43.1%	23.8%	2.5%
I can know the location of my desired items through file and folder names or label descriptions.	3.8%	15.0%	43.1%	27.5%	10.6%
I find difficulty in finding the information items I need.	7.5%	32.5%	50.0%	9.4%	0.6%

Perceptions of Privacy and Security Related Issues

A major concern of storing personal information items in the space provided by the Internet services was maintenance of their privacy and security. Nearly 72% of the students 'agreed' or 'strongly agreed' that they do not store their sensitive personal information, or they only store those items that they intend to share with others (Table 5). Similarly, only 31.9% of the students 'agreed' or 'strongly agreed' that online storage services can adequately protect their personal digital items. Finally, over 56.2% of the students agreed that they can control sharing of their personal digital items with the intended individuals. On the whole, it appeared that many students had reservations about the level of privacy and security provided by the Internet services; nevertheless they agreed that these services provide a useful platform for sharing personal digital items with the intended users.

Table 5. Perception of privacy and security of personal digital items (N=212)

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I don't put sensitive personal information in the storage provided by the internet services.	5.0%	7.50%	15.63%	31.9%	40.0%
I store only those personal information items that I want to share with others.	2.5%	10.7%	14.38%	45.0%	27.5%
Internet services can adequately protect my information items from frauds, vandalism, break-ins, theft, etc.	8.1%	35.6%	24.38%	28.8%	3.1%
I can control the level of sharing personal information items to my intended audience.	1.9%	13.1%	28.75%	50.6%	5.6%

Conclusion

Storage space provided by the Internet services can help account holders to put their personal digital items at a centralized location thus reducing the problem of information fragmentation. However, many potential users have reservations about the privacy and security of their personal digital items. These concerns have been exacerbated by recent vandalism attempts of highly secured websites. They feel if people can break into the highly secured websites, it will be rather easier for them to steal personal digital items. In order to encourage the use of online storage services for managing personal digital items, it is desirable that additional security measures be implemented. This study also revealed that although a majority of the students were using online storage for maintaining selected personal digital items, they were not adequately using the information organization features of these services. These days even an ordinary person produces or collects a large number of digital items; therefore, it is necessary for him/her to possess adequate knowledge of managing personal information. Libraries can take the initiative and make PIM part of user education. Once a person is able to properly manage his personal information, he can easily apply these skills for

managing his work related information. Finally if all employees in an organization know how to manage their work-related information, the organization as a whole will benefit by taking full advantage of its information and knowledge assets.

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